

Psychological Issues Related to Illness and Injury in Athletes and the Team Physician: A Consensus Statement—2016 Update

DEFINITION

Team physicians must address the physical and psychological issues related to athletic activity. This athletic activity may result in illness and injury, and produce a variety of psychological responses, some of which may negatively affect sports participation. Additionally, psychological factors, especially stress, may be an important antecedent to injuries. These factors may play an important role in injury treatment and rehabilitation and contribute to successful return-to-play (RTP). Several psychological issues, including stress/anxiety, depression, eating disorders, and substance use disorders can have illness or injury as triggers and/or have unique presentations in the athletic population. Some athletes may be predisposed to certain psychological issues.

This document will address select psychological issues and in particular focus on issues related to the team physician and their role in recognizing athletes at risk and providing referrals for additional care.

GOAL

The goal of this document is to help the team physician improve the care of the athlete by understanding the relationship between psychological issues and athletic performance, illness, injury, treatment, and RTP. To accomplish this goal, the team physician should have knowledge of and be involved with:

- Psychological and sociocultural antecedents and risk factors of athletic illness and injury.
- Psychological issues accompanying athletic illness and injury treatment, rehabilitation and RTP.
- Recognition of salient features of select psychological issues and how these may present in athletes and affect health and wellness.
- Select psychological issues in athletes:
 - Stress/Anxiety
 - Depression
 - Attention Deficit/Hyperactivity Disorder (AD/HD)

- Disordered Eating/Eating Disorders (DE/ED)
- Substance Use Disorders

- Identification and collaboration with the mental health care network (e.g., clinical or counseling psychologists, neuropsychologists, psychiatrists, licensed clinical social workers, psychiatric mental health nurses, licensed mental health counselors, primary care physicians with core competencies to treat mental health disorders) (10).
- Encourage, coordinate and facilitate referrals to a member of the mental health care network as part of a comprehensive treatment plan.

SUMMARY

This document provides an overview of selected medical issues that are important to team physicians who are responsible for the care and treatment of athletes. It is not intended as a standard of care, and should not be interpreted as such. This document is only a guide, and as such, is of a general nature, consistent with the reasonable, objective practice of the healthcare profession. Adequate insurance should be in place to help protect the physician, the athlete, and the sponsoring organization.

This statement was developed by a collaboration of six major professional associations concerned about clinical sports medicine issues; they have committed to forming an ongoing project-based alliance to bring together sports medicine organizations to best serve active people and athletes. The organizations are the American Academy of Family Physicians, American Academy of Orthopaedic Surgeons, American College of Sports Medicine, American Medical Society for Sports Medicine, American Orthopaedic Society for Sports Medicine, and the American Osteopathic Academy of Sports Medicine.

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PSYCHOLOGICAL ANTECEDENTS OF ATHLETIC INJURIES

Psychological and sociocultural factors (Table 1) have been identified as key components in the biopsychosocial model of sport injury risk factors (15). These factors are personalized to the athlete and may vary over time and by circumstance.

Psychological factors and other sociocultural factors alone do not reliably predict athletic injury risk. However, there has been a consistently demonstrated relationship between one psychological factor—stress—and athletic injury risk.

Stress may be defined as the demands of a situation exceeding the resources to respond to those demands (see Table 2). Athletes who experience high levels of stress, whether on or off the field, are at greater risk of being injured. Certain subpopulations of athletes, such as those experiencing high life stress and low personal coping skills, may be at an even greater risk of sustaining athletic injury. Stress causes attentional changes (e.g., narrowing of attention, general distraction, increased self-consciousness, mental fatigue) that interfere with an athlete's performance. Stress has been shown to cause increased muscle tension and coordination difficulties which increase the athlete's risk of injury. Teaching athletes stress management techniques has been shown to reduce injury rates over a season of participation. Athletes who have high resiliency, optimism, self-efficacy (belief or expectation in one's ability to succeed or affect change), and a supportive social network have more effective methods of responding to stress.

It is *essential* the team physician:

- Recognize that psychological and sociocultural factors may play a role as antecedents to athletic illness and injury.
- Specifically recognize that stress is related to athletic injury risk.

TABLE 1. Examples of sport injury risk factors.

Psychological	Sociocultural
<ul style="list-style-type: none"> • Anxiety/worry • Hypervigilance • Body image • Perfectionism • Coping and resources • Life event stress • Risk-taking behaviors • Mood state • Self-esteem 	<ul style="list-style-type: none"> • Social resources and pressures • Organizational • Stress • Academic/athlete roles • Coaching quality • Rules of sport • Culture of sport and team

TABLE 2. Selected signs and symptoms of stress.

Behavioral	Physical	Psychological
Difficulty sleeping	Feeling ill	Negative self-talk
Lack of focus, overwhelmed	Cold, clammy hands	Uncontrollable, intrusive and negative thoughts or images
Consistently performs better in practice/training than in competition	Profuse sweating	
Substance misuse/abuse	Headaches	Inability to concentrate
Increased frustration and anger	Increased muscle tension	Self-doubt
	Altered appetite	

It is *desirable* the team physician:

- Promote monitoring by the athletic care network (team physician, certified athletic trainers and other health care providers) of major life events and stressors (e.g., death in family, divorce, change in peer relationships, life transitions) that may place athletes at greater risk for injury.
- Understand stress may reveal or exacerbate underlying mental health issues.
- Recognize signs and symptoms of stress.
- Prepare strategies to address psychological factors that may contribute to the risk of athletic illnesses and injuries including:
 - Education of coaches and parents regarding the effects of attitudes and behaviors that equate illness and injury with worthlessness (e.g., “go hard or go home,” “no pain, no gain”) that may increase stress and consequently increase injury risk.
 - Awareness and sensitivity to the normative team culture regarding injury and pain and play.
 - Education of coaches and parents regarding excessive training and competition regimens in athletes.
 - Recognition of and addressing life stressors, coping skills, and resources during preseason evaluations, and follow-up intervals.
 - Identification of and collaboration with the mental health care network to provide psychological support services (e.g., stress management, counseling) and peer intervention programs.

PSYCHOLOGICAL REACTIONS ACCOMPANYING ATHLETIC INJURY

To an athlete, an illness or injury can be a significant life event, and may affect the athlete's cognition, emotions, and behaviors. The athlete's cognitive interpretations and appraisal of the illness or injury may determine their emotional response, which may then affect the behavioral aspects of the resulting treatment, such as goal setting, motivation, compliance, and adherence to the treatment (see Table 3).

The cognitive response involves athletes attempting to understand and acknowledge medical information relevant to their specific illness and injury. The athlete will participate in decisions regarding treatment options, including content and timing, and develop responses to treatment, rehabilitation, and RTP.

TABLE 3. Examples of problematic cognitive responses to injury (3).

Competency	"I can't play this sport anymore."
Self-efficacy	"I will lose my spot on the team."
Concern of reinjury	"I won't do that exercise or activity because it will make things worse"
Question identity	"Who am I if I can't compete?"
Inappropriate strategies	"I will do twice as much to get better quicker."
Concerns about medical team	"Do these providers know what I need?" "Are they capable?"

Emotional responses are expected, will be personalized to the athlete, may be adaptive or maladaptive, and may vary over time and by circumstance. There are no predictable sequences or content of the emotional response. Inclusion of the athlete in treatment decisions may modify the emotional response. These responses may include anger, denial, sadness, fear, grief, feelings of isolation, irritability, lack of motivation, frustration, and feeling disengaged. These are frequent and dependent on other factors, including antecedent psychological and sociocultural factors.

For many athletes, exercise and sports participation serves as a primary coping mechanism and outlet for dealing with psychological issues and may also be a major component of their self-identity. In these athletes, an illness or injury may result in a more intense emotional response.

Problematic emotional responses occur when symptoms are persistent, worsen over time and/or the severity of the symptoms seems excessive (Table 4). Depression is an especially significant warning sign. It magnifies other emotional responses and may impact recovery from illness or injury. Interventions to address problematic responses are more successful early in treatment and are discussed in individual sections.

Most studies conclude that the athlete's response to illness and injury should be viewed as dynamic and highly individualized, and may fluctuate over time. There are assessment tools that have been developed to monitor the athlete's emotional response. Serial evaluations may offer a continuing profile of the individual's progression. Use of these tools may improve communication between the athletic care network and the athlete, provide a quick and easy display of the athlete's perspective, and increase the athlete's engagement.

It is *essential* the team physician understand:

- Emotional responses will accompany athletic illness and injuries and may vary over time and by circumstance.
- These responses often resolve, but may become problematic.

It is *desirable* the team physician:

- Promote monitoring of emotional reactions by the athletic care network.
- Encourage, coordinate, and facilitate referrals to a member of the mental health care network as part of a comprehensive treatment plan.
- Educate athletes, coaches, and parents regarding emotional responses to illness and injury recovery.
- Promote utilization of a supportive social network in illness and injury response.

PSYCHOLOGICAL ISSUES OF ATHLETIC ILLNESS AND INJURY TREATMENT AND REHABILITATION

Psychological factors are known to play key roles in the athlete's response to illness and injury and affect the:

- Athlete's perception of the illness or injury itself
- Impact of the illness or injury on short-term and long-term athletic activity
- Athlete's life outside of sport
- Expectations for treatment and outcome
- Athlete's satisfaction with the athletic care providers

An athlete's psychological traits may influence decision-making regarding treatment and may substantially impact post-illness and injury and postoperative treatment, rehabilitation and outcomes. The team physician and the athletic care network need to be aware of these factors and develop effective treatment protocols for identification of and intervention for possible harmful factors. Three prominent psychological factors that have been shown to be important in illness and injury treatment and outcomes are pain perception, optimism/self-efficacy, and depression/stress.

Pain perception. Altered psychological and behavioral responses to pain can result in pain catastrophizing (PC), an exaggerated negative mental set regarding actual or anticipated pain experiences, and/or kinesiophobia (KP), the active avoidance of movement out of fear of recurrent pain or reinjury. These factors can negatively affect pain and function scores, can frequently be seen early in the injury course and are thought to affect treatment and outcomes by several mechanisms.

These behavioral responses to pain include persistent symptoms, poor rehabilitation compliance, decreased activity, and increased use of pain medicine.

Optimism/self-efficacy. A consistent relationship has been found between the presence of self-confidence, optimism, resilience, self-efficacy, motivation to recover, recovery from previous illness and injury, and successful outcomes from illness and injury treatment (lower reported levels of pain, higher scores on functional tests, and higher return to sport participation). Pessimism and low self-efficacy are associated with less favorable outcomes, as measured by poor rehabilitation task completion and adherence to home exercise, presence of continued symptoms and decreased physical activity.

TABLE 4. Examples of problematic emotional responses.

Persistent Symptoms	Worsening Symptoms	Excessive Symptoms
Alterations of appetite	Alterations of appetite into disordered eating	Pain perceptions and behaviors
Sleep disturbances	Sadness into depression	Excessive anger or rage
Irritability	Lack of motivation into apathy	Frequent crying or emotional outbursts
Sadness	Disengagement into alienation	Substance misuse/abuse
Anger		
Fatigue		

Depression, stress, and social support. Increased stress and depressed mood create negative feedback to the athlete in the recovery from injury, and can impact treatment and outcomes. The type and quality of social support can modulate the effect of stress and depression and may affect the perception of pain and the pain avoidance response (PC and KP). The major effect of these alterations is on the participation in rehabilitation and the expectations of future athletic capability. Among the major sources of social support may be continued team participation and the resulting maintained sense of athletic self-identity. Other sources of support may include specific psychological referrals and interventions during treatment and rehabilitation.

Assessment and intervention. A basic behavioral measure is a log of compliance with rehabilitation sessions and evidence of steady improvement in completion of rehabilitation tasks and goals. Tools have been developed to monitor psychological factors, which may affect illness and injury treatment, although none of these tools are specific to the athletic population. Examples include the Pain Catastrophizing Scale, Tampa Scale of Kinesiophobia, Patient Health Questionnaire (PHQ-9), and Generalized Anxiety Disorder (GAD-7). Serial assessments may offer a continuing profile of the individual's progression.

Alteration in the expected progression of recovery from illness or injury or expression of problematic behavioral patterns may benefit from early referral to the mental health network. Characteristics of poor progression of recovery include:

- Unreasonable fear of reinjury
- Continued denial of injury severity and response to recovery
- General impatience and irritability
- Rapid mood swings
- Withdrawal from significant others
- Extreme guilt about letting the team down
- Dwelling on minor physical complaints
- New somatic complaints unrelated to original illness or injury
- Obsession with the question of RTP

Studies have suggested the use of psychological strategies such as goal setting, positive self-statements, cognitive restructuring, and imagery/visualization is associated with faster recovery. These strategies may be helpful by reducing stress and increasing coping mechanisms and social support.

A number of factors should be considered when treating injured athletes. These factors include:

- *Building trust and rapport with the ill or injured athlete.*
Listening is particularly important, not only to make a medical diagnosis but also to assess and monitor the athlete's emotional state.
- *Educating the athlete about the illness or injury.*
It is critical that explanations of illnesses or injuries be presented in terms the athlete can understand. Provide opportunities for the athlete to verbalize an understanding and ask questions and clarify expectations

about the condition and its treatment, prognosis, and realistic RTP.

- *Identifying misinformation about the illness or injury.*
An injured athlete may obtain inaccurate information from a variety of sources (e.g., parents, coaches, teammates, Internet) that may contribute to confusion and emotional upheaval.
- *Identifying the athlete's social support network.*
It is important to assess the athlete's social support network as well as the athlete's perception of the network. Encouraging and facilitating peer support (e.g., providing access to another athlete who has successfully recovered from a similar illness or injury).
- *Encouraging the use of specific stress coping skills.*
An injured athlete may experience considerable stress throughout the injury and rehabilitation process. Psychological and physiological techniques will enhance coping skills (Table 5).
- *Preparing parents, coaches, and other stakeholders for the injury recovery process.*
With the athlete's permission, these people should be educated that an injury is best managed on an individualized basis. In addition, coaches should be encouraged to help the injured athlete avoid isolation from the team. Communication with other providers can be helpful in decreasing misinformation supplied to the athlete and coach.
- *Encourage and facilitate referral to the mental health network.*
Some athletes may benefit from referral to the mental health network.

It is *essential* the team physician:

- Recognize psychological factors play a key role in illness and injury treatment and rehabilitation.
- Understand athletic illness and injury treatment and rehabilitation programs should incorporate psychological as well as physiological techniques.

It is *desirable* the team physician:

- Coordinate a comprehensive rehabilitation program that addresses physical and psychological issues, including provision of psychological support services as needed.
- Encourage and facilitate the athlete's involvement in goal setting.
- Coordinate graduated return to practice and play to promote psychological readiness.
- Assess an athlete's social support network.

TABLE 5. Selected techniques for coping with stress.

Cognitive-Based Techniques	Somatic-Based Techniques	Cognitive Behavioral Techniques
Thought stopping	Slow, deep or centered breathing	Goal setting
Thought replacement and imagery	Progressive muscle relaxation	Stress management training
Positive self-talk	Biofeedback training	
Mindfulness strategies		

- Educate athletes, parents, families, friends, and others about the importance of a supportive social network.

PSYCHOLOGICAL ISSUES AND RTP

Psychological readiness is one criterion for RTP (6). Emotional reactions, including a lack of confidence, apprehension and fear, may accompany an athlete's RTP. Many athletes who sustain a significant illness or injury have doubts about being fully recovered, concerns about recurrent illness or reinjury, and questions about achieving their previous level of athletic competence.

These psychological responses are connected with issues of:

- **Competence:** fear of recurrent illness or reinjury, or inability to return to previous levels of activity
- **Relatedness:** feelings of isolation as they attempt to return, loss of social identity
- **Autonomy:** increased pressures to return before they feel they are ready

Unless addressed, these responses may become problematic, impact general health and wellness, interfere with performance, and increase the risk of recurrent illness and/or reinjury.

RTP processes and decisions should include assessment in these areas. The team physician should assess not only physical factors, but emotional responses, when making the RTP decision. In conjunction with medical care, the supportive social network can help reduce the emotional upheaval and stress accompanying an injury and its rehabilitation. Athletes who have any problematic response to injury, alteration in the expected progression of recovery from illness or injury, or expression of problematic behavioral patterns may benefit from a referral to the mental health network. In these situations, input from these providers may be helpful in making the RTP decision.

It is essential the team physician understand:

- Physical readiness to RTP may not correlate with psychological readiness.
- Psychological factors may be key components in the RTP decision after an illness or injury.

It is desirable the team physician:

- Coordinate the athletic care network to monitor the psychological readiness of athletes who are preparing to RTP or have returned-to-play.
- Encourage and facilitate efforts to maintain the athlete's contact with the team to enhance psychological readiness.
- Maintain awareness of psychological and sociocultural influences on the RTP decision.
- Conduct a preparticipation screening for the presence of psychological factors in the athlete.
- Monitor the athlete for psychological factors that may affect treatment and rehabilitation.
- Encourage, coordinate, and facilitate referrals to the mental health care network to minimize the negative effect of psychological factors during treatment and RTP.

SELECT PSYCHOLOGICAL ISSUES IN ATHLETES

The management of illness and injury associated with athletic activity is one of the roles of the team physician (4,5). This process involves understanding common psychological issues athletes may experience that impact mental health and ultimately impact performance and recovery from illness and injury. Having protocols in place for managing mental health emergencies and routine mental health referrals is important (10). This section references key features of mental health issues the team physician should recognize and understand. The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition outlines specific diagnostic criteria (1).

STRESS/ANXIETY

Definition. Stress may be defined as the demands of a situation exceeding the resources to respond to those demands. Stress can be seen as a response to specific pressures or events, such as injury, which usually resolves when the stressors disappear. Anxiety is an adverse effect of stress that may persist and have physical, cognitive, affective, or behavioral compensatory symptoms.

Anxiety disorders (e.g., panic disorder, generalized anxiety disorder) share features of excessive fear and anxiety and related behavioral disturbances. Biopsychosocial factors, including genetic susceptibility and environmental factors (e.g., early childhood trauma, substance use), interact with stress to produce these disorders.

Examples of stress categories for the athlete include:

- **Competitive.** Anything having to do with the athletic environment, including internal and external expectations, demands of daily training, and challenges regarding training schedule.
- **Organizational.** Environmental demands of the athlete's main organization, including coaching behavior, leadership expectations, team culture, and logistical issues (e.g., travel, team schedules).
- **Personal.** Everything outside of the athletic arena, including work–life balance, academic commitments, and personal relationships, among many others.

Additive stressors for student-athletes such as internal/external pressure regarding sport performance, academic performance, or relationships, can combine to reveal or exacerbate anxiety, depression, and other mental health issues.

Epidemiology. The exact prevalence of sport-related anxiety symptoms is unknown due to difficulties in assessing severity and type of symptoms. More athletes exhibit anxiety symptoms than are diagnosed by specific criteria for anxiety disorders. The most common non-injury-related psychological issues have been reported as stress/pressure and anxiety.

The prevalence of diagnosed anxiety disorders in adolescents range from 6% to 20%, and is much higher in females. In college students, 32% of male athletes and 49% of female

athletes self-report feeling the symptom of overwhelming anxiety in the last 12 months, compared with 41% and 57% in nonathletes, respectively.

Signs/symptoms. Generalized anxiety disorder (GAD) is characterized by excessive worry and anxiety for at least six months, and associated with at least three of these symptoms: restlessness or being on edge, easy fatigue, difficulty concentrating, irritability, muscle tension, and sleep disturbance. Suicidal ideation has been associated with GAD.

Panic disorder is a specific anxiety disorder that presents as a sudden onset of a panic attack, a feeling of intense fear and a general sense of helplessness and impending doom. Panic attacks can occur several times a day. Symptoms appear suddenly, peak rapidly and may include chest pain or dyspnea, palpitations or a pounding heart, sweating, trembling, nausea, dizziness, weakness, and numbness or tingling. Those symptoms are of more concern if they represent a dramatic change from the athlete's previous behavior.

Screening tools that can be used to help with the assessment of the severity of anxiety symptoms include the GAD-7 scale, the PHQ anxiety module and the Beck Anxiety Inventory. An age-appropriate Sport Anxiety Scale-2 can be used to assess levels of cognitive and somatic anxiety among athletes.

Treatment/outcomes. Cognitive-oriented treatments include cognitive behavioral therapy (CBT), which is the treatment of choice for sport-related anxiety symptoms and disorders. The goal of CBT is to shift the focus from negative self-thoughts and negative future outcomes to actions needed to perform well in the current moment. Mindfulness (state of active, open attention on the present; paying attention to thoughts and feelings without judgment) approaches have also been helpful in quieting the anxiety response.

Athletes with panic disorder have a heightened sensitivity to internal autonomic cues such as tachycardia, and CBT helps to identify triggers of panic and quiet the somatic reactions and catastrophizing thinking.

Medications may be useful in the treatment of anxiety and are often an adjunct to counseling, but may affect athletic performance.

Psychological factors have been identified to mitigate negative stressors, including:

- Positive traits/qualities (adaptive perfectionism, optimism, competitiveness, hope, proactivity, resilience, and perseverance)
- Motivation or drive to a goal
- Confidence (various sources of confidence were important, including coaches/teammates, and internal confidence from experience, preparation, self-awareness) or confidence tied to effort not outcomes
- Focus on relevant performance aspects
- Perceived social support from the athletic care network

It is *essential* the team physician:

- Recognize the signs and symptoms of stress and anxiety.

- Understand that not all anxiety is related to sports performance.
- Respect the confidentiality of the physician–athlete relationship when treating the athlete, except with permission or in circumstances where the athlete poses a danger to him or herself and/or to others.

It is *desirable* the team physician

- Encourage, coordinate, and facilitate referral to the mental health care network.
- Educate the athletic care network about the symptoms of stress and anxiety, as well as mental health services, to positively support athletes who are interested in seeking help.
- Identify and assess an athlete's social support network.
- Understand the effects of medications that may be prescribed to treat anxiety and potential interactions with other common medications.
- Understand that athletes may self-medicate for anxiety leading to negative health consequences (positive drug test, substance use disorders).
- Recognize that stressors, combined with a sport-related injury, may reveal or exacerbate underlying mental health issues.
- Facilitate the establishment of a multidisciplinary team of providers (physicians, athletic trainers, sport psychology professionals, mental health providers, psychiatrists) capable of evaluating, managing, or triaging negative responses to excessive stress and mental health conditions.

DEPRESSION

Definition. Depression is one of many mood disorders. The diagnosis of major depression requires either depressed mood and/or diminished interest/pleasure (anhedonia) and at least four of the following symptoms during a 2-wk period, nearly daily:

- Weight loss or decrease in appetite
- Insomnia/hypersomnia
- Psychomotor agitation or retardation
- Fatigue or energy loss
- Worthlessness or excessive/inappropriate guilt
- Indecisiveness
- Recurrent thoughts of death or suicide

Symptoms result in clinically significant distress or impairment in social, occupational, or other important areas of functioning. These are not due to the effects of substance or other medical conditions (e.g., thyroid conditions, overtraining syndrome, anemia).

Epidemiology. According to the NIH, 11.4% of the U.S. population (12–17 yr olds) were diagnosed with at least one major depressive episode in 1 yr. In those age 18–25 yr, the estimated prevalence of depression is 8% to 9%. The data for depression in athletes are limited.

- Prevalence of clinically relevant depressive symptoms in college athletes may be up to 23.7%
- Female college athletes are at 1.8 times greater risk for clinically relevant depressive symptoms than male college athletes
- Population risk factors in college athlete: female, freshman class and sport (e.g., track and field)
- In college students, 21% of male and 27% of female athletes self-report feeling “so depressed it is difficult to function” in the last 12 months, compared with 27% and 34% in nonathletes, respectively
- Individual factors in college athletes may increase the risk for depression (13)
 - Illness and injury
 - High performance expectations: self, coaches, teammates, family
 - Time management pressures
 - Strong self-identity as an athlete

Signs/symptoms. In addition to usual diagnostic symptoms of depressed mood and anhedonia, athletes may experience other symptoms of depression (e.g., anger, guilt, hopelessness, low self-esteem, concentration or attention problems, feeling of helplessness, irritability, sleep disturbance, risk-taking behavior, substance misuse/abuse, decreased performance).

Screening tools that can be used to help with the assessment of the severity of depression include the PHQ-9, the Beck Depression Inventory-Fast Screen and Center for Epidemiologic Studies-Depression.

Treatment/outcome. Athletes may underreport symptoms of depression and be less likely to seek treatment for and discuss concerns about depression. Depression may be a risk factor for suicide in athletes. Suicide is the third leading cause of death in college athletes and the second leading cause of death in college students. Optimal treatment for depression in the general population is a combination of medication and psychotherapy (e.g., cognitive-oriented treatments including CBT).

- Further research is needed to identify optimal treatment strategies in athletes.

The same psychological factors that mitigate stress and anxiety may also apply in mitigating depression.

It is essential the team physician:

- Recognize the signs and symptoms of depression, including risk for self-harm or suicide.
- Refer any suicidal athlete for immediate crisis intervention.
- Understand that not all depression is related to sports performance.
- Respect the confidentiality of the physician–athlete relationship when treating the athlete, except with permission or in circumstances where the athlete poses a danger to him or herself and/or to others.

It is desirable the team physician:

- Encourage, coordinate, and facilitate referral to the mental health care network.
- Educate the athletic care network about the symptoms of depression, as well as mental health services to positively support athletes who are interested in seeking help.
- Educate coaches, family, and certified athletic trainers about their important role in “giving permission” to seek mental health services.
- Identify and assess an athlete’s social support network.
- Understand the effects of medications that may be prescribed to treat depression and potential interactions with other common medications.
- Understand that athletes may self-medicate for depression leading to negative health consequences (positive drug test, substance use disorders).
- Facilitate the establishment of a multidisciplinary team of providers (physicians, athletic trainers, sport psychology professionals, mental health providers, psychiatrists) capable of evaluating, managing, or triaging negative responses to depression and other mental health conditions.
- Consider screening for depression in all athletes.
- Recognize that depression may complicate recovery from injury and interfere with successful RTP.

AD/HD

Definition. Attention Deficit/Hyperactivity Disorder is characterized by a pattern of inattention/hyperactivity-impulsivity shown to be more severe than those at comparable level of development. The presence of some hyperactive-impulsive or inattentive symptoms (Table 6) must be present before age 12 yr. Impairment from symptoms must occur in more than one setting. Impairment is seen in developmentally appropriate social, academic or vocational function. Typically, a referral for specialized evaluation is indicated for this condition.

Attention Deficit/Hyperactivity Disorder (AD/HD) has three subtypes:

- AD/HD predominantly inattentive type
- AD/HD predominantly hyperactive-impulsive type
- AD/HD predominantly combined type

TABLE 6. Core symptoms of AD/HD (11).

Core AD/HD Symptoms	
Inattention	Hyperactivity/Impulsivity
1. Fails to give close attention to detail and makes careless mistakes.	1. Fidgets with hands or feet
2. Difficulty sustaining attention on tasks.	2. Leaves seat when it is inappropriate.
3. Does not fully complete tasks or follow through on instructions.	3. Excessively active and/or feelings of restlessness
4. Problems with organizing tasks and activities.	4. Difficulty with engaging in leisure activities quietly.
5. Avoids tasks that require sustained mental effort.	5. On the go as if “driven by a motor.”
6. Loses things necessary for tasks and activities.	6. Talks excessively
7. Easily distracted by extraneous stimuli.	7. Blurts things out while in conversation.
8. Forgetful in daily activities.	8. Difficulty awaiting turn.
	9. Interrupts or intrudes on others' activities or conversations.

Epidemiology. AD/HD is seen in 3% to 7% of school-age children and 2.5% of adults. There is a greater propensity in males than females. More than half of school-age children diagnosed with AD/HD have symptoms that persist into adolescence and adulthood. In a survey of college-age students, 5.3% admitted to the nonmedical misuse of AD/HD stimulant medication (11).

Signs/symptoms. Diagnosis is often made by a licensed mental health care provider using a combination of behavioral observation ratings, neuropsychological testing, and comprehensive clinical interview to rule in/out comorbid conditions. Assessment tools for the diagnosis of AD/HD include the Adult ADHD Self-Report Scale and Conners CPT-3™ (Conners Continuous Performance Test 3). Diagnosis by self-report scales alone is often not specific, as many reflect comorbid condition. Formal neuropsychological testing may have limited utility because it is conducted in a minimally distractible environment. These individuals may be more prone to:

- Rejection by peers
- Drug abuse
- Antisocial behavior
- Injury from risk-taking behavior (e.g., motor vehicle accidents)
- Psychological comorbidities: major depression, bipolar disorder, conduct disorder, oppositional defiant disorder, antisocial personality disorder, substance use disorder, and anxiety.

Treatment/outcomes. Athletes with AD/HD may be managed in coordination with the mental health care network as well as the team physician, parents, teachers, school counselors and nurses, and coaches. In some cases, exercise may improve AD/HD and comorbid mood disorder symptomatology. Behavioral and psychosocial management and modification techniques are typically a first line of treatment, followed by consideration of medication options. Combination treatments are generally the most successful.

Medication options include stimulants and non-stimulants. Stimulants may be banned in certain sports, may require a therapeutic use exemption (TUE) and may be associated with decreased tolerance to exercise in the heat and sleep disturbances. Both stimulant and nonstimulant medications have cardiovascular effects, and monitoring blood pressure and pulse are recommended.

It is *essential* the team physician:

- Recognize signs and symptoms of AD/HD.

It is *desirable* the team physician:

- Encourage, coordinate, and facilitate referral to the mental health care network.
- Educate or provide resources to the athletic care network about AD/HD, the medications used to treat this condition, and potential side effects, including the risk for cardiac and heat related issues.

- Understand that with certain medications, documentation may be required for the athlete to meet the conditions specified by organizing bodies (e.g., NCAA, IOC).
- Understand the consequences of untreated AD/HD may include dangerous driving, academic underachievement, impaired peer relationships, delinquent behavior, impulsive sexual activity, increased development of substance use disorders, depression/anxiety disorder, disruptive behavior, and increased likelihood of repeating school grade.

DISORDERED EATING/EATING DISORDERS

Definition. Disordered eating (DE) occurs on a spectrum, featuring the restriction of energy intake to significantly reduce body weight. This ranges from calorie, protein, and/or fat restriction and pathogenic weight control measures (e.g., diet pills, laxatives, excessive exercise, self-induced vomiting) to classic eating disorders, such as anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED) and other specified eating or feeding disorders. Athletes in sports involving aesthetics, endurance, and weight classifications are at particular risk for the spectrum of disordered eating (2). DE and ED are often associated with other medical and psychiatric comorbidities.

Eating disorders are psychiatric disorders which have a hallmark distortion of body image, with associated nutritional and medical complications.

Anorexia Nervosa

- Restriction of energy intake relative to requirements, leading to a significantly low body weight.
- Dominant features:
 - Strong need for control, evidenced by concrete thinking, limited social spontaneity, perfectionism, preoccupation with and/or restriction of food.
 - Perception of body image, evidenced by intense fear of gaining weight or becoming fat, and disturbance in the way in which one's body weight or shape is experienced.
- Risk factors:
 - Extreme exercise, especially when combined with dieting. Exercise is excessive when it interferes with important activities, occurs at inappropriate times or settings, or when an individual continues to exercise despite injury or other medical complication and has been advised to refrain).
 - Early-age dieting
 - Participation in lean, aesthetic or weight-restricted sports (e.g. gymnastics, ballet, figure skating, distance running, wrestling).
- Characterized by a BMI less than $18.5 \text{ kg}\cdot\text{m}^{-2}$ to indicate low weight. For children and adolescents, a BMI below the fifth percentile suggests underweight.
 - Severity is based on BMI (mild $\geq 17 \text{ kg}\cdot\text{m}^{-2}$ to extreme $<15 \text{ kg}\cdot\text{m}^{-2}$)

- Psychiatric comorbidities: depressive, obsessive compulsive personality, bipolar, and anxiety disorders.
- Medical complications include cardiovascular, endocrine/metabolic (notably amenorrhea and hypoglycemia), bone health issues, electrolyte abnormalities, gastrointestinal, hematologic, and neurologic abnormalities (8).

Bulimia Nervosa

- Recurrent episodes of binge eating characterized by both of the following:
 - Eating an amount of food that is definitely larger than what most individuals would eat in a similar period of time.
 - A sense of lack of control overeating during the episode
- Recurrent inappropriate compensatory behaviors to prevent weight gain: self-induced vomiting; laxative misuse, diuretics, or other medications; fasting; excessive exercise.
- Self-evaluation is unduly influenced by body shape and weight.
- Generally normal weight, but may be slightly overweight or underweight. Individual may conceal food or hoard food for binges, usually secretive, either planned or spontaneous.
- Severity is based on frequency of episodes of inappropriate compensatory behaviors per week from mild (1–3 wk) to extreme (≥ 14 wk).
- Associated psychiatric comorbidities: mood and bipolar disorders; personality disorders, specifically borderline personality disorder; substance use disorders; increased incidence of attempted suicide; kleptomania (stealing); and promiscuity.
- Medical complications include cardiovascular conditions, endocrine/metabolic (menstrual dysfunction), electrolyte imbalance, gastrointestinal issues and dental enamel loss.

There are other eating disorders including BED, and other specific eating or feeding disorders, which share some, but not all, features of AN and BN.

Epidemiology

- Athletes are at higher risk for developing ED than nonathletes.
 - In elite female athletes, 18% to 20% met criteria for ED compared with 5% to 9% of female controls.
 - ED among male athletes is increasing.
 - In college men, ED ranges from 4% to 10% and includes AN, BN, and BED. Males represent approximately 10% of AN cases.
 - Increased incidence of ED in lean- or weight-controlled sport athletes. Men in sports such as bodybuilding, wrestling, and light-weight crew are at greater risk.
- Anorexia nervosa indicates a lifetime prevalence 0.5% to 1%. The crude mortality rate is approximately 5% per decade.

- Most individuals experience remission within 5 yr of presentation, but remission rates may be lower in individuals who are hospitalized.

- BN indicates a lifetime prevalence 1% to 5%. Crude mortality rate is nearly 2% per decade.
 - Study of elite athletes; overall prevalence of ED of 13.5% in elite athletes and 4.6% in a control group of nonathletes.

Signs/symptoms. Nutritional and medical consequences of the spectrum of disordered eating include:

- Weight
 - Low body weight or significant weight loss for AN
 - Low, normal, or overweight for BN
- Nutritional deficiencies and electrolyte disturbances
- Decreased bone mineral density
 - Stress fractures, osteopenia/osteoporosis
- Gastrointestinal problems (e.g., bleeding, ulceration, bloating, constipation)
- Cardiovascular abnormalities (e.g., arrhythmias, heart block)
- Psychiatric problems (e.g., depression, anxiety, suicide)

General risk factors for ED include:

- Pressure to optimize performance and/or modify appearance
- Psychological factors, such as low self-esteem, poor coping skills, perceived loss of control, perfectionism, obsessive compulsive traits, depression, anxiety, history of sexual/physical abuse, and family dysfunction.
- Underlying chronic diseases related to caloric utilization (e.g., diabetes, thyroid)

Assessment tools that can be used to help detect ED/DE are the “SCOFF” questionnaire and Eating Disorder Inventory.

Treatment/outcomes. Early identification through preparticipation examinations and clinical awareness in illness and injury evaluation, and early intervention have been shown to shorten the recovery from an ED. These are psychiatric diseases and not primarily nutritional problems. Therefore, referral to a member of mental health care network is indicated.

Treatment may include:

- Psychotherapy (including CBT, group therapy, family-based counseling)
- Supervised weight restoration
- Medical monitoring (e.g., blood pressure, pulse, electrolytes)
- Dental examination
- Nutritional consultation
- Consideration of hormone replacement therapy
- Other medications, which may be beneficial in select situations
- Other options may include outpatient, partial hospitalization (full-day outpatient care), residential, or inpatient hospitalization.

The level of play/RTP decision is especially important in ED/DE athletes independent of sport. Scoring systems have been developed to evaluate risk and aid in the level of play/RTP decision in both male and female athletes (8,9). These scoring systems may be used as guidelines, but decisions regarding level of play/RTP will need to be made on a case-by-case basis.

Important components of the evaluation include but are not limited to disordered eating behavior, BMI, menstrual status, history of stress fractures, medical stability, and prior history of ED as well as other psychological diagnoses. A BMI of less than $18.5 \text{ kg}\cdot\text{m}^{-2}$ is one indicator for further evaluation and screening for eating disorders.

Athletes with ED/DE should be referred to a member of the mental health network and treated with multidisciplinary team that includes a dietitian. The desire of athletes to continue to compete in their sport can aid in their recovery. There are situations where the sport may only contribute to the eating disorder, and there will be a need to remove the athlete from the sport. The ultimate goal is to aid the athlete in their recovery back to health, even if that means temporarily limiting or completely removing an athlete from their sport.

The majority of athletes with ED/DE and the medical consequences of those behaviors are able to participate in training and competition. All members of the multidisciplinary team should be involved not only in the treatment of the athlete, but also in level of play/RTP decisions.

For those athletes whose level of play needs to be modified based on the scoring systems above:

- Sign a written contract outlining the treatment requirements and level of activity parameters.
 - As the athlete's health status improves, their level of activity may be increased.
 - If no progress is made in the given time period, then level of play may need to be decreased or completely restricted.

It is essential the team physician understand:

- The spectrum of disordered eating and how it affects the athlete.
- ED/DE can occur in any sport and in both male and female athletes.
- The importance of prevention and early detection of the spectrum of disordered eating.

It is desirable the team physician:

- Encourage and facilitate referral to a member of the mental health care network.
- Understand the evaluation and treatment of the athlete with disordered eating.
- Understand the importance of educating the athletic care network.
- Coordinate or implement programs for the prevention and early detection of ED/DE.
 - Be aware of behaviors associated with ED.

- Educate athletes and coaches on the risk factors and signs and symptoms of ED and the role team culture may play in the development of eating disorders, in particular, tying performance to weight and emphasizing appearance.
- Encourage coaches to consult the athletic care network regarding weighing of their athletes.

- Identify risk factors during the preparticipation examinations and clinical evaluations, including the use of specific screening questions for identification (e.g., SCOFF, Eating Disorder Inventory)
- Educate athletes and coaches, including information to dispel misconceptions about body weight, body composition, and athletic performance.

SUBSTANCE USE DISORDER

Definition. Substance use is defined as consumption through ingestion, inhalation, injection, a chemical, hormone, or hormone analog that has psychogenic or ergogenic properties for the purposes of mood modulation or performance enhancement. Substance use disorders result when use is excessive or coupled with functionally significant impairment, such as health problems or failure to meet major responsibilities at school, work or home, and usually associated with impaired control, social impairment, or risky use (14).

Substances used by athletes may include mood modulators such as alcohol, cocaine, heroin, or marijuana; medications to treat the symptoms of illness or injury such as opiates for pain, or legal or illegal medications to assist with healing and subsequent performance, including anabolic-androgenic steroids (AAS) and stimulants. Substance use and substance use disorders are prevalent in the adolescent and young adult population, including athletes at all levels (Table 7).

- Substance use may reflect poor stress-coping and maladaptive responses to internal and external pressures to succeed.
- In the context of illness or injury, or with conditions like overtraining, under-recovery, and sleep deprivation, substance use may be an attempt to “stay on the field” despite disabling conditions.
- Athletes may be particularly vulnerable during transition periods, such as retirement/graduation or a career-ending injury.

TABLE 7. Substance use in college and adolescents (12).

Drug	Percent Substance Use within Last 12 Months	
	NCAA (12)	MTF (7)
Alcohol	80.5	79.2
Cigarettes	10.3	23.4
Marijuana	21.9	34.9
Amphetamines	4.7	11.1
Cocaine	1.8	3.1
AAS	0.5	0.3
Synthetic marijuana	1.6	4.3

Epidemiology

- Athletes with problem behaviors, such as aggression and bullying are associated with increased risk for heavy use of alcohol and drugs.
- Higher levels of athletic team participation are associated with decreased cigarette smoking and marijuana use, but higher prevalence and frequency of using smokeless tobacco, alcohol, and performance-enhancing drugs.
 - Athletes in contact/collision sports are twice as likely to binge drink and use marijuana after graduating high school.
 - Substance use in college athletes is typically highest among Division III student-athletes, and for most substances appears to be on the rise relative to trends in Division I and Division II.
- In college students, more male athletes self-report substance use; alcohol use is similar in both male and female athletes.
- Excessive drinking (10+ drinks in one sitting) is six times higher in college age male student-athletes than female student-athletes. Approximately one in nine college students, and one in five males, report drinking at least 10 drinks in a sitting.
- Athletes who are substance users and especially those with substance use disorders are more likely to have problems associated with alcohol, including getting into fights, driving while intoxicated, and having impaired judgment that leads to injuries away from the playing field.
- Alcohol use and alcohol-related problems were significantly lower among athletes in individual sports compared with team sports.
- A concerning, growing trend is the use and abuse of prescription opiates.
 - Legitimate opioid use in high school students before graduation is independently associated with a significant increased risk of future opioid misuse after high school.
 - Adolescent males in organized sports are twice as likely to be prescribed opioid medications, 10 times as likely to unintentionally misuse opiates, and four times as likely to intentionally use opiates for recreational purposes.
 - Approximately one in four college athletes use prescription opiates and about 25% of those use them without a prescription (12).
- AAS/testosterone analogs or boosters, steroid-like substances (e.g., DHEA, GHB, human growth hormone)
 - Abuse of AAS occurs for performance improvement, physique development, and body image enhancement.
 - AAS: NCAA 0.7% of males, 0.1% of females, 7% of adolescents
 - Other similar substances: NCAA 2.6%
 - Human growth hormone: 12% of male adolescents and 7% of female adolescents

- Legal supplements are sometimes “tainted” with AAS
- Athlete use of AAS is associated with psychological problems: mood and anxiety disturbances, reckless behavior, increased aggressiveness, mood destabilization, eating behavior abnormalities, and psychosis.
- Fourteen percent of college athletes report use of ADHD medicines, with two-thirds using without a prescription
 - Lacrosse, wrestling, baseball, and ice hockey show higher use.
- Adolescent data from the Monitoring the Future (MTF) program showed 3.7% of male and 3.1% of female athletes used amphetamine/dextroamphetamine for nonmedical purposes.

Signs/symptoms. Substance use disorders are often characterized by a variety of physical and behavioral signs and symptoms, including change in overall attitude or personality, decreased academic performance and a change in social relationships. Specific physical signs may include but are not limited to mood swings, agitation, withdrawal, appetite and sleep pattern changes, and weight change.

Treatment. Athletes with substance use disorder may be managed in coordination with the mental health care network. Some treatment options include individual and group counseling, in-patient and residential treatment, intensive out-patient treatment, medication, 12-step programs, and peer support.

Assessment tools exist to audit and screen for substance use and abuse, such as Cannabis Use Disorder Identification Test (CUDIT-R, Adamson), Alcohol Use Disorders Identification Test (AUDIT-C), “CAGE” questionnaire (10).

It is *essential* the team physician:

- Recognize the signs and symptoms of substance use disorder.
- Maintain confidentiality, recognizing issues surrounding substance use disorders are particularly sensitive.

It is *desirable* the team physician:

- Encourage, coordinate, and facilitate referrals to a member of the mental health care network for specialized treatment.
- Facilitate the establishment of a multidisciplinary team of providers (physicians, athletic trainers, sport psychology professionals, mental health providers, psychiatrists) capable of evaluating and managing substance abuse and addiction.
- Understand that substance use disorders are a growing issue in the athlete population.
- Be aware of the different risk profiles for substance use and substance use disorders.
- Work with the athletic care network to educate athletes on the potential dangers of substance use and the potential for substance use disorders.
- Consider substance use screening tools during preparticipation physicals and clinical assessments to monitor potential substance abuse problems among athletes.

- Understand that substance use may be an attempt to modulate mood and/or performance. It may also represent a maladaptive coping mechanism in response to illness and injury.

REFERRING ATHLETES TO THE MENTAL HEALTH CARE NETWORK

Athletes experience emotional responses to illness and injury, and most of these responses are transient. The athletic care network and social support network are often effective in helping the athlete deal with these issues. However, athletes with significant risk factors and/or problematic emotional reactions who need treatment should be referred to a member of the mental health care network. The most important consideration is the referral is made to a licensed practitioner qualified to provide mental health services. Ideally, these providers also possess proficiencies in the care and treatment of athletes and understand the culture of sport (5).

Sport performance consultation (e.g., performance enhancement, life skills training, imagery) may be provided by licensed or nonlicensed individuals. However, licensed mental health practitioners have met the minimum educational and training requirements by their state and are the only mental health providers licensed to treat problematic emotional responses (Table 2).

Among athletes, there are different levels of comfort with referral to licensed mental health providers. Obstacles to referral include general apprehension, stigma of mental health

treatment, confidentiality concerns, perception of others, fear of revealing symptoms, and misunderstanding of mental health treatment. In addition, accessibility to providers and issues related to reimbursement may serve as obstacles to obtaining treatment. Team physicians and other members of the athletic care network's attitude and level of comfort with mental health issues may have an impact and influence on an athlete's willingness to accept mental health care. In treating both transient and problematic emotional responses, athlete confidentiality is of particular importance (5).

It is *essential* the team physician:

- Identify members of the mental health care network to facilitate athlete referrals.
- Maintain confidentiality, recognizing psychological issues are particularly sensitive.

It is *desirable* the team physician:

- Integrate members of the mental health care network into the illness and injury treatment team (team physicians, certified athletic trainers and other health care providers).
- Emphasize the importance of mental health and wellness to the athletic care network.
- Destigmatize treatment for mental health issues.
- Encourage, facilitate, and coordinate referrals to the mental health care network.
- Involve members of the mental health care network in educational and interventional programs for coaches and athletes about mental health and wellness.

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